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**USWEST**

Laura D. Ford  
Vice President  
Federal Regulatory

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

December 17, 1993

William Caton, Secretary  
Federal Communications Commission  
1919 M. Street N.W., Rm 222  
Washington, DC 20554

Re: U S WEST- Personal Communications Services  
(Related docket 93-253) -Ex Parte Filing

Dear Mr. Caton:

Yesterday, December 16, 1993, representatives from U S WEST met with Evan Kwerel; Jonathan Cohen; David Reid; John Williams and Jonathan Terry of Office Plans and Policy to discuss PCS related dockets 93-253 (Auction). Representing U S WEST were Laura Ford, Vice-President, Federal Regulatory; Sue Mason, Director, Personal Communications Development and Michael Rothkopf, Rutgers University. The attached document on Competitive Bidding served as the basis for the discussion. The meeting did not conclude until 6:00 p.m. causing the delay in filing this ex parte.

In accordance with Commission Rule 1.1206(a)(2), the original and one copy of this letter including attachments are being filed with your office. Acknowledgment and date of receipt of these transmittals are requested. A duplicate letter is attached for this purpose. Please let me know if you have questions.

Sincerely,



Laura D. Ford  
Vice-President-Federal Regulatory

cc: Evan Kwerel, Jonathan Cohan, David Reid, John Williams, Jonathan Terry

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## **Response to the Milgrom-Wilson Proposed Auction Form**

### **Statement of**

**Michael H. Rothkopf**

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**December 15, 1993**

1. I have been asked by U S WEST to comment on the simultaneous repeated auctions proposed to the Commission in section VI. of the joint Statement of Paul R. Milgrom and Robert B. Wilson. What follows are such comments and some suggested modifications of that proposal.

2. The Milgrom-Wilson proposal is well written and shows much careful thought and insightful analysis of alternative auction forms. In particular, it has found a way to obtain the deliberateness associated with written bids while retaining much of the advantages of oral auctions. In view of the value of the licenses to be auctioned, this is an important contribution.

3. The original Milgrom-Wilson proposal was deficient in three ways, each of which calls for modifications. The three problems that it had are its rule for terminating the auction which, in the worst case, could allow the auction to continue for years, its default rule which can be improved upon, and its failure in the face of significant economies of scale and scope to facilitate license aggregation.

### **AUCTION TERMINATION RULE**

4. The auction termination rule originally proposed by Milgrom and Wilson needs to be improved. Under it, the worst case duration for the auction is very long, indeed, since a 5% increase in the high bid for any one license keeps the auction going another day. A bidder may choose to keep the entire auction open by advancing the price of a low value property by a small (absolute) amount. This could conceivably be done repeatedly by one or two bidders with a vested interest in delaying the conclusion of the sale.

5. This possibility can be avoided by adding a supplemental rule relating to the collective advance, rather than individual advance, for ending the auction. Such a rule might be that the auction ends if the sum of the high bids does not increase by, perhaps, 0.1%. Furthermore, it would not be unreasonable for the amount of the required collective advance to increase periodically by, perhaps another 0.1% each week after the auction has proceeded a few weeks.

6. There is a potential problem in the termination rules just proposed in 5. It is possible that a bidder who values highly a license will be high bidder on that license and, therefore, not bid again on it in the next round but find that, due to the operation of the rule on lack of collective advance, some other bidder has raised the bid on it by (a mere) 5% and that the auction has ended. The way to avoid this kind of possibility is to have the auction end only on licenses for which no advance has occurred. For licenses for which there has been an advance, the auction would close with respect to all bidders except those who were high for that license or who offered an advance for it in the otherwise final round. The continued auction could continue to be subject to the original collective advance requirements, thus almost assuring an immediate end to the bidding on any license upon which the bidding had ceased to advance.

7. The amended Milgrom-Wilson proposal's termination rule is much improved. However, even if it is used, it may be desirable to have a supplemental rule for auction termination based upon minimal collective advance.

#### THE DEFAULT RULE

8. The default rule originally proposed by Milgrom and Wilson presents potential problems. Milgrom and Wilson propose that if a bidder defaults on any bid, all of his bids are defaulted and the second highest bidder for each license is then awarded the license at his last bid. Their proposal doesn't say so, but it left open the possibility that the Commission would go to the third best bid if both the first two bidders default and so on. (If this were not done, there might be a different problem from the one discussed below--failure to sell a valuable license.)

9. This default rule presents a problem for a bidder operating under a budget constraint. If he bids on one license after his bid on another has been bettered, he runs the risk of winning both if there is a default. If this happens, it could cause him to exceed his budget, perhaps greatly. This in turn could force him to default. It is not inconceivable that a single default could induce an entire cascade of resulting defaults each larger than the previous one. In addition, concern about this possibility could inhibit bidding.

10. It would be difficult to avoid the impact of defaults completely, but it might be mitigated greatly and cascades of increasingly larger defaults avoided by allowing a bidder thrust into a winning position by a default to default himself without further penalty on winnings of his choice that, in total, are of no greater price than the additional financial demand placed upon him by the default. A tight time limit for exercising this option should be required. In addition, in exercising this option, a bidder should not be allowed to default without penalty on a bid, that if defaulted, will leave him the winner of the same

license at a lower cost. (This could happen, for example, if the bidder originally offering the second highest bid is now in default.)

11. The revised Milgrom-Wilson proposal deals with prompt defaults by reopening the auction. This implies that bidders who have apparently won a license and who have been required to deposit 20% of their bid may, eventually lose the license. If this is acceptable, then the Milgrom-Wilson approach to defaults is workable. However, if it is not, or perhaps for dealing with more delayed defaults, the above comments may be useful.

#### ECONOMIES OF SCALE AND SCOPE

12. In its reply comments, U S WEST also addressed the problems with the combinatorial bidding suggested in the Commission's NPRM. Namely, combinatorial bidding would create additional complexity in the auction process, and the proposed combinatorial bidding process would jeopardize the likelihood of licenses being assigned to the firms which value them the most. U S WEST argued that oral auctions can facilitate the aggregation of licenses, thus making combinatorial bidding unnecessary. I agree with U S WEST's comments as they relate to the proposal to mix oral ascending and combinatorial sealed bids in one auction process. However, under the Milgrom-Wilson proposal, combinatorial bidding may be appropriate.

13. The versions of the Milgrom-Wilson proposal I have seen force bidders to commit irrevocably to each bid they make without any assurances that it will be awarded any other license. Thus, unlike oral ascending auctions of largest to smallest markets, it will be difficult for a bidder with synergy in values for different licenses to bid in a way that reflects that synergy. Any such bidding would have to depend upon knowledge of the values and strategies of competitors. Such knowledge may well be unavailable. Even if it is available, the need for it destroys one of the key and often noted advantages of progressive auctions such as the one proposed.

14. If the Commission were to adopt the Milgrom and Wilson proposal, some allowance for the interdependent values might be made. Milgrom and Wilson do not discuss the computational difficulty of allowing bids for all possible combinations of tracts. That difficulty was discussed in the comment by Professor McAfee submitted by the PacTel Corporation, and it is currently insurmountable. However, there is no computational reason why bids on certain combinations of licenses could not be allowed in the simultaneous repeated auction format. I do not have a firm recommendation for the Commission on including a limited number of combinations in a Milgrom-Wilson style auction. However, I do have some observations that may be helpful.

15. In particular, if the allowable combinations have a "tree structure" so that no combination is allowable if it contains part but not all of some other

combination, then evaluation of bids involving combinations is computationally trivial. For example, if licenses A through E are to be auctioned, the following combinations would form a tree structure: A, B, C, D, E, AB, CD, and ABCDE. In evaluation bids, one would start at the "small branch" end of the tree. The high bids for A and for B would be summed and the sum compared to the high bid for AB to determine whether the individual bids or the combined bids were the current high bid. After a similar comparison for C, D, and CD, these current high bids and that for E would be compared with the high bid for the overall combination, ABCDE, to determine the overall high bids. Note that a combination CDE could easily be added to this iterative evaluation scheme. However, the combination AB cannot, since in the presence of AB, it violates the condition given above for a tree structure.

16. It may be possible for the Commission, with advice from industry, to define non-overlapping sets of economically important regional licenses, and to divide some of such regions into economically reasonable non-overlapping subregional sets.

17. Even if the Commission finds that there is some disagreement on an appropriate tree structure, it could proceed with the use of a limited number of alternative tree structures.

18. It is important to note that when synergies between licenses in a region are important, as they are here, including national combinational bids without including regional ones may not be an improvement.